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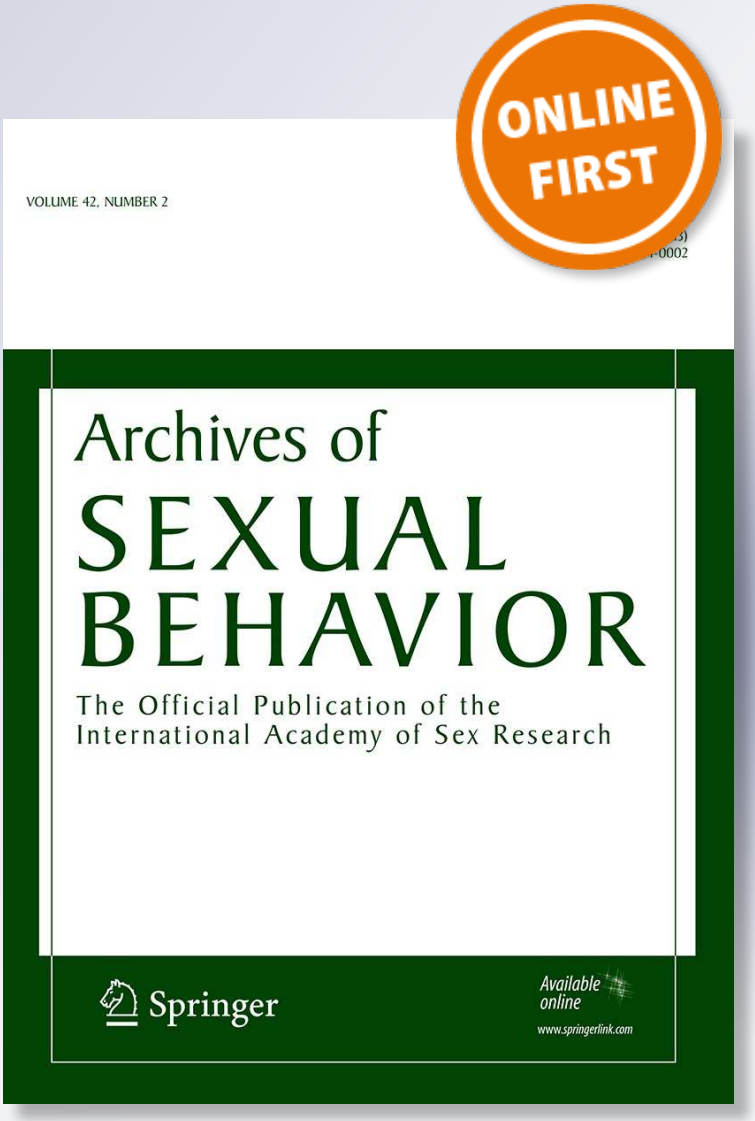

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ORIGINAL PAPER

Measures of Clinical Health among Female-to-Male Transgender Persons as a Function of Sexual Orientation

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Abstract The present study examined the sexual orientation classification system that was used in the DSM-IV-TR for categorizing those who met the Gender Identity Disorder diagnostic criteria in order to determine the extent to which female-to-male transgender persons (FTMs) differ on psychological variables as a function of sexual orientation. Participants were 605 self-identified FTMs from 19 different countries (83 % U.S.) who completed an internet survey assessing their sexual orientation, sexual identity, symptoms of depression and anxiety, stress (Depression Anxiety Stress Scales), social support (Multidimensional Scale of Perceived Social Support), and health related quality of life (SF-36v2 Health Survey). Over half the sample (52 %) reported sexual attractions to both men and women. The most common sexual identity label reported was "queer." Forty percent of FTMs who had begun to transition reported a shift in sexual orientation; this shift was associated with testosterone use. Overall, FTMs ranged from normal to above average on all psychological measures. FTMs did not significantly differ by sexual attraction on any mental health variables, except for anxiety. FTMs attracted to both men and women reported more symptoms of anxiety than those attracted to men only. Results from the present study did not support a sexual orientation classification system in FTMs with regard to psychological well-being.

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Introduction

Despite a wealth of social scientific and clinical data, as well as a growing body of sound theoretical development, gender identities persistently become confused with sexual orientation in both lay and scholarly discourse (Devor, 1993b; Feinberg, 1996; Halberstam, 1998; Rubin, 1975; Valentine, 2007). Contemporary scholars, particularly feminist and LGBT researchers whose work focuses on the complex ways that these categories are actually lived (Bockting, Benner, & Coleman, 2009; Devor, 1993b; Diamond, 2002; Feinberg, 1996; Halberstam, 1998), routinely critique psychology and psychiatry for clinging to outdated conflations of sex, gender, and sexual orientation (Drescher, 2010; Wilson, 2000; Winters, 2007).

A person's sexual orientation refers to their "relatively stable tendency to seek sexual partners of the same gender, other gender, or both genders" (Diamond, 2001, p. 174; emphasis added) while one's sexual identity is the label a person ascribes to their sexuality (Savin-Williams, 2006). These concepts rely on unchanging sex/gender realities and therefore fail to adequately capture the increasingly unstable experiences of a growing number of individuals in the contemporary United States (Diamond, 2008; Vrangalova & Savin-Williams, 2012).

Gender affirmation surgeries, which can range from $3,000 to $100,000 and are typically not covered by most insurance plans, are economically unavailable to many transgender people. Less costly hormones and body modifications (such as breast binders and prosthetic genitalia) allow more individuals to live in the gender with which they identify, presenting a dilemma for would-be categorizers of this population. Moreover, the number of transgender individuals who delay, forego, and/or purposely "mix-up" these elements of gender transition

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pose an even greater challenge to concepts of sexual identity that rely on stable and unchanging experience.

The transgender partner adds an additional level of complexity to theories about sexual orientation. *Transgender* is broadly defined as "any individual whose gender-related identification or external presentation either violates conventional conceptualizations of male or female or mixes different aspects of male and female role and identity" (Diamond & Butterworth, 2008, p. 365). In evaluating the sexual orientation of transgender persons, then, one must keep in mind the referent point with regard to labels: if using birth assigned sex as the referent, then a female-to-male transgender man (FTM) who is attracted to males is heterosexual, but if using gender identity as the referent, that FTM would be gay. Some trans people find it disrespectful, and even ego-dystonic, to be referred to as "non-homosexual" when they actively identify as gay.

FTMs (or trans men) are individuals who were assigned a female birth sex, but experience their gender as male; this term includes those who have experienced gender dysphoria (Devor, 1997b). Some FTMs choose to forego a medical transition while others have achieved full legal recognition as males (Devor, 1997b); some in the latter category consider themselves men rather than transgender or transsexual (Devor, 1993a; Newfield, Hart, Dibble, & Kohler, 2006). Despite being assigned female, FTMs with male identities and attractions towards women may see themselves as "straight" while those attracted to men may identify as "gay" (Bockting et al., 2009; Devor, 1993a, 1993b). Thus far, researchers have not maintained consistency when dealing with these differences: while most studies classify transgender persons as non-homosexual or homosexual relative to their birth sex (Chivers & Bailey, 2000; Johansson, Sundbom, Hojerback, & Bodlund, 2010), others have used gender identity to categorize participants (Bockting et al., 2009; Schleifer, 2006).

The past two decades have seen a growing interest in documenting the sexual behaviors and identities of transgender populations (Bockting et al., 2009; Diamond & Butterworth, 2008; Lawrence, 2010; Rachlin, 1999). Much of this research has suggested that transgender typologies (e.g., Blanchard, 1985, 1989 and the DSM-IV-TR) based on sexual orientation (homosexual/non-homosexual) may not adequately capture the full range and complexity of FTM sexuality (Devor, 1993b; Johansson et al., 2010; Lawrence, 2010) as this population varies across sexual orientation, gender identity, degrees of body modification, use of hormonal therapies, and economic access to trans/LGBT resources (Rachlin, Hansbury, & Pardo, 2010).

Sexual Orientation Specifiers

For the purpose of this article, we classify sexual orientation by attractions, as introduced by the DSM-IV-TR's specifiers for the Gender Identity Disorder (GID) diagnosis. This has resulted in four categories: FTMs who report attractions to women (AW), those who report attractions to men (AM), those who report attractions to both men and women (AB), and those who are attracted to neither (AN).

Research exploring the role of sexual orientation in trans people includes Blanchard's (1985, 1989) early work with male-to-female transgender women (MTFs). Although his theory remains controversial (Dreger, 2008; Nuttbrock et al., 2011), it is still used as the diagnostic schema for gender dysphoric persons (Lawrence, 2004, 2007, 2010). The current study attempts to examine the utility of the DSM-IV-TR's typology in a community sample of FTMs.

While empirical support exists for use of sexual orientation specfiers in the MTF population, much less exists for use with FTMs (Lawrence, 2008). Early research on sexual orientation with this latter population found that those diagnosed with GID reported almost exclusive sexual attractions toward women (APA, 2000; Lawrence, 2010; Pauly, 1974). But some research suggests that AM FTMs are more prevalent than previously thought (Coleman, Bockting, & Gooren, 1993). Case studies have presented FTMs who were attracted to men both before and after transition (Coleman & Bockting, 1988; Coleman et al., 1993) and research with community samples has highlighted the experiences of AB and AM FTMs (Bockting et al., 2009; dickey, Burnes, & Singh, 2012). One study examined the identity development of AM FTMs and found that they were more likely to be bisexual than exclusively attracted to men (Bockting et al., 2009). It is likely that previous clinically based research may have overlooked these realities given that AB and AM FTMs may have withheld information about their sexual orientation in order to facilitate medical treatment from providers. Cultural homophobia and taboos may have also played roles (Bolin, 1994; Bullough & Bullough, 1998; Denny, Green, & Cole, 2007; Lev, 2004; Meyerowitz, 2002; Sullivan, 1990).

Complications with the Present Specifier System

Examination of the sexual orientation specifiers for use in the FTM population has understandably produced mixed results (Bockting et al., 2009; Chivers & Bailey, 2000). Studies have found AW FTMs to be more "masculine," have more cross-gender identification as children, and to prefer more feminine partners more than AM FTMs (Chivers & Bailey, 2000; Zucker et al., 2012). The groups did not differ on desire for masculine characteristics or body modification. Smith, van Goozen, Kuiper, and Cohen-Kettenis (2005) found evidence that AM FTMs reported more shyness and psychoneuroticism than AW FTMs. Even with this information, researchers challenge the utility of a sexual orientation schema for determining high-risk FTM candidates for gender-related surgery (Bockting et al., 2009; Coleman et al., 1993); this is further complicated by labels and partner preferences that may change after hormone

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therapy or surgery (Bockting et al., 2009; Daskalos, 1998; Devor, 1993a; Hines, 2007; Schleifer, 2006).

Psychosocial Well-Being

For the sexual orientation typology to be generally useful for clinical work with FTMs, differences in psychosocial well-being should be pronounced. Depression is very common among transgender persons and LGB populations, due to the high prevalence of victimization, discrimination, social stigma, negative social responses, and family rejection (Clements-Nolle, Marx, & Katz, 2006; Herek, Gillis, & Cogan, 2009; Ryan, Huebner, Diaz, & Sanchez, 2009). It is likely, therefore, that FTMs who are attracted to men (gay or bisexual by gender identity) would be at a greater risk for depression.

LGB persons commonly experience anxiety regarding coming out related to a belief that being gay is wrong (Beck, 1995; Sandfort, de Graaf, Bijl, & Schanbel, 2001), and research among these populations has found them to be at greater risk for anxiety disorders and symptoms than their heterosexual counterparts (Herek et al., 2009; Whisman, 2008). Anxiety is theorized as one of the first stages of identity formation among trans people (Devor, 2004) and cross-sectional studies have found testosterone use to be related to less anxiety (Gomez-Gil et al., 2012; Meier, Fitzgerald, Pardo, & Babcock, 2011). Similar to depression, we propose that those who are both FTM and gay or bisexual are likely to be at higher risk for anxiety.

Social acceptance of AM FTMs is more difficult than among AW FTMs. Coleman et al. (1993) speculated that the social support of AM FTMs declines due to the "double adjustment" (i.e., trans and gay) that must be made by families who are conditioned by heteronormative social scripts (Lev, 2005). Non-transgender (NT) gay men have more depression and less sense of belonging to a community than NT heterosexual men (McLaren, Jude, & McLachlan, 2007), and NT bisexual people are socially rejected more often than monosexuals reporting lower levels of connection to their community than gay and lesbian adults (Balsam & Mohr, 2007).

Though AM and AB FTMs may face rejection from NT gay and bisexual men (especially if they are not perceived as men), there are some potential problems with assuming that they have less social support than do AW FTMs. Some AW FTMs initially come out in the context of a supportive lesbian community, having recognized their sexual attraction first. But, AM FTMs may also identify as lesbian for a period of time during their development (Bockting et al., 2009; Coleman et al., 1993; Schleifer, 2006). The emphasis on female–female attractions as integral to lesbian identity (Diamond, 2005) may be related to the rejection that some FTMs experience from these communities once they come out as straight trans-identified men (Bockting et al., 2009; Devor, 1997a; Green, 2004).

Little research to date has examined differences in quality of life (QOL) between FTMs of differing sexual orientations. The only studies to have examined FTM's QOL found that it was diminished relative to male and female NT counterparts (Newfield et al., 2006) and testosterone use was related to higher QOL (Meier et al., 2011). In an online sample of FTMs, those age 18–34 years reported lower QOL than the national normative sample and older FTMs' scores did not differ from normative data (Newfield et al., 2006). Even though younger FTMs' scores were significantly lower, their scores were within less than one SD of the national sample ($M = 47.76$; national average $= 50$; $SD = 10$; norms from Ware, Kosinski, & Keller, 1994).

It has been suggested that AM FTMs have lower QOL because they are discriminated against by potential sex partners. As AM FTMs enter the gay community, they face social and sexual rejection, especially if they have not had genital surgery (Schilt, 2009). Although the World Professional Association for Transgender Health recommends providers do not discriminate against trans people of varying sexual attractions, historical and anecdotal reports claim that healthcare professionals may refuse to care for gay trans people, leading to prolonged transition periods for some AM FTMs (Lev, 2005; Meyer et al., 2001).

Aside from small case studies, no peer-reviewed research has examined AB FTMs, although some studies have grouped them with AM FTMs (Bockting et al., 2009; Chivers & Bailey, 2000). Though this parallels some research with NT bisexual persons (Ross, Dobinson, & Eady, 2010), others have highlighted the importance of separating bisexual persons from those who identify as gay (Balsam & Mohr, 2007; Herek et al., 2009).

Research examining NT bisexual persons found them to report poorer mental health than heterosexual, gay, and lesbian persons, including feeling greater self-stigma related to their sexual orientation (Herek et al., 2009; Ross et al., 2010). If AB FTMs' psychological well-being is similar to that of NT bisexuals, AB FTMs may experience increased levels of depression, anxiety, and stress, lower QOL, and decreased support from their communities and families.

The Present Study

The current study examined the prevalence of different sexual orientations, sexual orientation labels, and shifts in the FTM community, and tested for group differences among FTMs who were "attracted-to-women," "attracted-to-men," or "attracted-to-both." In so doing, this study examined the clinical utility of using the sexual orientation typology for FTMs. This project focused on measuring psychologically relevant variables in FTMs of different partner preferences. The present hypotheses, informed by previous research (Ross et al., 2010; Smith et al., 2005), were that AM trans men would report higher levels of depression, anxiety, and stress, and lower quality of life and social support than AW FTMs. Second, it was hypothesized that ABs would also report higher levels of

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depression, anxiety, and stress, and lower quality of life and social support than AWs and AMs. Multiple significant differences between groups would support sexual orientation classifications of FTMs.

Method

Participants

Data from 605 FTMs were collected for this study, but 503 participants were included in the multivariate analyses. Participants were dropped from all analyses due to failure to meet the minimum age requirement of 18 years ($n = 12$) and asexual participants were excluded based on small sample size ($n = 12$). Additionally, participants were dropped from the multivariate analyses because of incomplete surveys ($n = 78$).

Sample demographics are shown by sexual attraction in Table 1. Most participants reported living in the United States (83 %; $n = 482$). Of the 18 other countries ($n = 99$), 41 % were from Europe; 41 % Canada and Mexico; 12 % Australia; 5 % Asia; and 1 % South America. The mean age of the sample was 27 years (SD = 8.03; range, 18 to 71). The majority (82 %) of the sample was White. Most (83 %) of the sample had at least some college education and the majority of the sample reported working full or part-time jobs (55 %), while 29 % indicated they were students. Over half (63 %) of the sample reported a gross annual income of $25,000 or less. About a third of participants (31 %) were living without disclosing their transgender history or, colloquially, "stealth."

Just over two-thirds (67 %) of the sample reported taking testosterone at the time of the survey. The majority (89 %) of these participants were using intramuscular injection of testosterone, with other participants reporting using gel, subcutaneous injection, cream, patches, or implants. Reported injection frequencies ranged from weekly to every 4 weeks. Of those who had not taken testosterone, the majority (86 %) desired to do so in the future. A total of 238 (41 %) participants reported having had chest reconstructive surgery (CRS), including double incision, peri-areolar, or liposuction, and 21 (4 %) reported having had genital reconstructive surgery (GRS), including phalloplasty, metoidioplasty, vaginectomy, centurion, and/or testicular implants. Of the FTMs who have not undergone the procedure, 92 % desired CRS and 39 % desired GRS.

At the time of the assessment, most (52 %) participants reported attractions to both men and women, 31 % reported attractions to women only, and 17 % reported attractions to men only. Although all participants were classified into one of three sexual orientation groups, participants used many different words to define their sexual orientation. The most common word used was "queer" ($n = 183$; 31 %). See Table 2 for the distribution of self-reported sexual orientation identities by attraction. Of those who had begun their transition at the time of the assessment ($N = 507$), more than one-third (40 %) reported a shift in sexual attractions ($n = 203$). Table 3 summarizes the direction of attraction shift among the participants who had started their transition at the time of the assessment.

Measures

Depression, Anxiety, Stress Scales

The DASS is a 42-item measure of depression, anxiety, and stress experienced over the past week (Lovibond & Lovibond, 1995a). The DASS demonstrates concurrent and construct validity in the acceptable to excellent range (Antony, Bieling, Cox, Enns, & Swinson, 1998). The DASS uses a 4-point Likert response scale, from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time) over the past week. The scale has been shown to correlate .74 with the Beck Depression Inventory and .81 with the Beck Anxiety Inventory (Lovibond & Lovibond, 1995b). Reliability for the total scale was excellent ($\alpha = .96$). The Cronbach's reliability coefficients for the subscales were .96 (depression), .87 (anxiety), and .92 (stress), suggesting good to excellent internal consistency. Higher scores on each scale indicate more symptoms of depression and anxiety and higher levels of stress.

Multidimensional Scale of Perceived Social Support

The MSPSS is a 12-item scale that assesses social support from friends, family, and a significant other (Zimet, Dahlem, Zimet, & Farley, 1988). This study used the total support subscale. Responses were based on a 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). The three subscales have adequate discriminant, concurrent, and construct validities (Clara, Cox, Enns, Murray, & Torgrud, 2003). Internal consistency for this subscale was good ($\alpha = .90$). Higher scores indicate higher levels of perceived social support.

Short Form 36-Item Questionnaire Version 2

The SF-36v2 is a comprehensive measure of quality of life. It has been used with FTM samples in previous research and is valid for online use (Newfield et al., 2006). It yields eight subscales with reliabilities in the .93 to .95 range for all subscales (Ware, 2003). The current study used the General Health subscale, which demonstrated good reliability ($\alpha = .84$). The 5 items from the General Health subscale use a 5-point Likert scale from 1 (poor) to 5 (excellent) and 1 (definitely true) to 5 (definitely false). Higher scores indicate higher levels of quality of life.

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Table 1 Demographic variables by sexual orientation

Variable	AM[a] *N* (%)	AB[b] *N* (%)	AW[c] *N* (%)	Statistical analysis
Ethnicity				$\chi^2(2) = 3.2$
Hispanic	4 (4 %)	25 (8 %)	18 (10 %)	
Race				$\chi^2(10) = 19.4, p < .05$
Black or API[d]	2 (2 %)	6 (2 %)	16 (9 %)[i]	
Caucasian	88 (87 %)	245 (81 %)	140 (79 %)	
Multi-racial and Other	10 (10 %)	50 (17 %)	22 (12 %)	
Education				$\chi^2(10) = 5.3$
HS/GED or less	11 (11 %)	33 (11 %)	17 (10.0 %)	
Associate's or Technical School	8 (8 %)	14 (5 %)	14 (7.9 %)	
Some College	38 (38 %)	116 (39 %)	66 (37.1 %)	
Bachelor's	21 (21 %)	71 (24 %)	49 (27.5 %)	
Post-Grad	21 (21 %)	66 (22 %)	31 (17.4 %)	
Work Status				$\chi^2(12) = 17.0$
Full Time	28 (28 %)	130 (43 %)	73 (41 %)	
Part Time	11 (11 %)	44 (15 %)	29 (16 %)	
Unemployed	16 (16 %)	27 (9 %)	16 (9 %)	
Disability	3 (3 %)	9 (3 %)	7 (4 %)	
Student	38 (38 %)	83 (28 %)	50 (28 %)	
Other[e]	3 (3 %)	7 (2 %)	2 (1 %)	
Income				$\chi^2(20) = 39.4, p < .01$
<$5,000	37 (37 %)[i]	69 (23 %)	40 (23 %)	
$5,000–24,999	35 (35 %)	116 (38 %)	70 (39 %)	
>$25,000	27 (27 %)	115 (38 %)	67 (38 %)	
HRT[f]				$\chi^2(2) = 1.9$
Yes	65 (64 %)	210 (70 %)	114 (64 %)	
CRS[g]				$\chi^2(2) = 1.3$
Yes	46 (46 %)	119 (39 %)	73 (41 %)	
GRS[h]				$\chi^2(2) = 3.5$
Yes	4 (4 %)	7 (2 %)	10 (6 %)	
Non-Disclosing or "Stealth"				$\chi^2(2) = 3.1$
Yes	26 (26 %)	88 (29 %)	63 (35 %)	
Total	101	302	178	

Values represent number of participants over the age of 18, excluding asexual participants ($N = 581$). Total percents may not add up to 100 due to missing cases

[a] Attracted to men

[b] Attracted to men and women

[c] Attracted to women

[d] Asian Pacific Islander

[e] Temporary, homemaker, or retired

[f] Hormone replacement therapy: Testosterone

[g] Chest reconstruction surgery

[h] Genital reconstruction surgery

[i] Significant difference

Sexual Attraction

FTMs were asked to indicate whether they were attracted to men (AM), attracted to women (AW), attracted to both (AB), or attracted to neither (AN). Sexual attraction was based on what was reported at the time of the assessment. Participants were also asked to define their sexual orientation in their own words and to indicate if their sexual attractions had shifted,

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Table 2 Sexual orientation labels by attractions

Labels	AM[a] *N* (%)	AB[b] *N* (%)	AW[c] *N* (%)
Queer	20 (19.6)	116 (35.7)	47 (27.2)
Straight/heterosexual		12 (3.7)	109 (63.0)
Gay/homosexual/faggot	75 (73.5)	14 (4.3)	4 (2.3)
Pansexual	1 (1.0)	73 (22.5)	2 (1.2)
Bisexual	2 (2.0)	74 (22.8)	
Flexible/fluid	4 (3.9)	9 (2.8)	3 (1.7)
Other[d]		13 (4.0)	1 (0.6)
Lesbian		7 (2.2)	7 (4.0)
(Poly)sexual or genderqueer		7 (2.2)	

Numbers will not add up to totals, as some participants listed more than one label to describe their sexual orientation

[a] Attracted to men

[b] Attracted to men and women

[c] Attracted to women

[d] Other includes "nothing," "unsure," "open," or "undefined"

Table 3 Shifts in sexual attractions

	Attractions		After transition	
		AM	AB	AW
Before Transition	AM	49 (72 %)	14 (21 %)	5 (7 %)
	AB	27 (16 %)	131 (79 %)	8 (5 %)
	AW	16 (6 %)	133 (49 %)	124 (45 %)

Values represent number of participants over the age of 18, excluding asexual participants, and participants who had not started their transition ($n = 74$). Here, "transition" includes identifying as male, living as male, hormone, and/or surgical treatment

including the direction of the shift, since the start of their transition. For the purpose of this study, any participant who selected "attracted to neither" ($n = 12$) was coded as "asexual" and was not included in the analyses due to inadequate sample size.

Procedure

As the FTM population is considered a "hidden population," use of the Internet for data collection is warranted (Rosser, Oakes, Bockting, & Miner, 2007). Participants were recruited via study advertisements circulated through online groups and discussion forums on LiveJournal, YouTube, and Facebook that were dedicated to FTM issues. FTM forum moderators approved all research announcements prior to online posting. Interested participants were directed to a secure website. Inclusion criteria were persons who were assigned female at birth and who currently identified as FTM or who once identified as FTM but now identify as male (Newfield et al., 2006).

Participants read an online informed consent page prior to completing the survey and provided consent to participate by clicking an "I consent" button. Upon survey completion, participants were entered into a lottery drawing for cash prizes. A graduate student research award to the first author provided funds for this research.

The online survey took approximately 25 minutes to complete. The 160-question survey was hosted on a secure server affiliated with the University of Houston. Data were collected from a secure web-based server called Hosted Survey. The Committee for the Protection of Human Subjects at the University of Houston approved subject recruitment. During the survey, participants were required to answer every item on each page in order to move to the next page. In order to insure that no participant could submit more than one response set, the server denied access to the survey to anyone with the identical IP address as a previous participant.

Data Analysis

The data were analyzed using PASW 18.0 (PASW Inc., Chicago, IL). Independent samples chi-square and *t*-tests were conducted to determine significant differences in demographics between sexual orientation groups, and independent samples chi-square tests were used to analyze whether or not there was a reliable shift in sexual orientation after gender transition. An independent samples chi-square was conducted to determine the relationship between sexual orientation shift and testosterone use, a logistic regression was conducted to determine if pre-transition sexual attraction and testosterone use contributed independent variance to sexual attraction change, and a between-subjects MANOVA was used to determine significant differences in psychosocial well-being among sexual orientation groups. The depression, anxiety, and stress variables were all positively skewed and the social support and quality of life variables were all negatively skewed; thus, a log-transformation was used for these data. For the MANOVA, the Pillai's Trace F value was used to adjust for deviations from normality and unequal sample sizes. The psychosocial well-being table presents non-transformed data.

Results

Univariate Analyses

Univariate analyses revealed that FTMs of varying sexual attractions did not differ by any demographic variables except income and race. Specifically, AW FTMs reported higher levels of income than AM or AB FTMs and AW FTMs were more likely to be Black or Asian than AM or AB FTMs. Refer to

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Table 1 for the relevant statistical analyses. Participants did not differ by age, $F(2, 578) < 1$.

In order to examine if the participants reported a change in their sexual orientation after transition, a 3 (Group: Sexual Orientation before Transition) × 2 (Sexual Orientation Shift after Transition: Yes vs. No) chi-square analysis was conducted, $\chi^2(2) = 53.02$, $p < .001$, indicating non-independence. Results from three paired contrast analyses showed that those who were AW before transition were more likely to report a change in sexual attraction after transition than the other two groups (pre-transition AM vs. AB $\chi^2(1) < 1$, AM vs. AW 14.4, $p < .001$, and AB vs. AW, $\chi^2(1) = 46.2$, $p < .001$).

A separate analysis was conducted to determine whether testosterone was related to shifts in sexual attraction. A chi-square test demonstrated a significant relationship between sexual orientation shift (Yes vs. No) and testosterone use (Yes vs. No), $\chi^2(1) = 22.81$, $p < .001$.

A logistic regression analyses was conducted order to determine if pre-transition sexual attraction (AW vs. AM vs. AB) and testosterone use (Yes vs. No) contribute independent variance to the outcome of sexual attraction change (Change vs. No Change). A test of the full model against a constant only model was significant for pre-transition sexual attraction, $\chi^2(2) = 49.49$, $p < .0001$, but not for testosterone use, $\chi^2(1) < 1$. Specifically, relative to participants who did not report a change sexual attraction, the odds of a shift in sexual attraction were significantly higher for participants who self-reported being AW pre-transition (OR = 4.35; 95 % CI = 2.78 6.67, $p < .0001$).

Psychosocial Well-Being

As expected, depression, anxiety, and stress were positively correlated; social support and quality of life were also positively correlated; depression, anxiety, and stress scores were each negatively correlated with social support and quality of life (Table 4). The significant correlations provide evidence for good discriminant validity and the small to moderate correlations indicated that the scales measured related, yet distinct constructs. Thus, the dependent variables were appropriate for use in multivariate analyses of variance (MANOVAs).

The means and standard deviations of the dependent variables for the three groups are shown in Table 5. Mean scores for almost all variables in each group fell within the normal range for depressive symptoms, anxiety symptoms, and stress. Of the 542 participants who completed the DASS, 37 (7 %) scored in the severe range and 30 (6 %) scored in the extreme range of depressive symptoms. For anxiety symptoms, 21 (4 %) scored in the severe range and 20 (4 %) scored in the extreme range. For stress, 22 (4 %) participants scored in the severe range and 5 (1 %) scored in the extreme range.

Bivariate correlations were conducted to determine if there was a relationship between the psychosocial well-being variables and length of time on testosterone. Depression, anxiety, and stress were each negatively correlated with length of time on testosterone, $r(524) = -.16$, $p < .001$; $r(526) = -.20$, $p < .001$; $r(526) = -.17$, $p < .001$. A positive correlation was found between time on testosterone and social support, $r(543) = .17$, $p < .001$. No significant relationship was found between length of time on testosterone and general health quality of life $r(491) = .07$.

Multivariate Analyses

To test whether FTMs of varying sexual orientations differed on clinical variables, we conducted a between-subjects MANOVA of sexual orientation on the dependent variables of depression, anxiety, stress, social support, and quality of life. As predicted, there emerged an overall significant effect of sexual orientation, $F(10, 994) = 3.02$, $p < .01$. Specifically, AB FTMs reported more symptoms of anxiety than AM FTMs (contrast estimate .14; $p < .01$) (see Table 6). There was no significant difference between AW FTMs and either AM or AB FTMs.

There was no main effect of sexual orientation group on depression, $F(2, 502) = 2.99$, stress, $F(2, 502) = 2.40$, perceived social support, $F(2, 502) = 2.06$, or health related quality of life, $F(2, 502) = 1.80$.

Discussion

The current study highlights the diversity of sexual attractions experienced in a community sample of FTMs and the data demonstrate generally healthy levels of psychosocial well-being. While it was expected that the majority of FTMs would report an exclusive attraction towards women (APA, 2000; Chivers & Bailey, 2000), the majority of FTMs were attracted to both men and women. Further, half of previously AW FTMs reported a shift in attractions to both men and women. Together, these trends both support the more recent research on the greater sexual fluidity observed among natal females (Diamond, 2008; Diamond, Pardo, & Butterworth, 2011), and complicate the idea that attraction towards other men is rare among FTMs.

Over the past 25 years, there has been an increasing acceptance towards non-heterosexual sexual attractions and a greater range of observable gender nonconforming expressions (Bockting et al., 2009; Devor, 1993a). In the present study, many FTMs described their sexual attractions using a variety of labels, including "queer," an identity term that indicates a desire to be understood outside of a classificatory system altogether (Gamson, 1995). Therefore, although it is difficult to construct more clinically or "research-friendly" categories of sexual orientations among the transgender population, if a classification system based on sexual orientation is used for this population, it must be more comprehensive than

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Table 4 Correlation Matrix (Pearson's)

	Depression	Anxiety	Stress	Social Support	Quality of Life
Depression	–				
Anxiety	.57***	–			
Stress	.65***	.70***	–		
Social Support	−.33***	−.23***	−.19***	–	
Quality of Life	−.31***	−.37***	−.33***	.20***	–

*** $p < .001$

Table 5 Means and SD for dependent variables by sexual attraction

Dependent Variable	AM M (SD)	AW M (SD)	AB M (SD)	Norms
Depression[a]	8.81 (9.27)	7.53 (8.88)	9.13 (8.98)	0–9
Anxiety[a]**	4.20 (5.53)[d]	4.80 (5.20)	5.57 (5.82)[d]	0–7
Stress[a]	9.27 (7.45)	9.77 (7.66)	10.97 (7.75)	0–14
Social Support[b]	4.89 (1.12)	5.18 (1.21)	5.17 (1.05)	5.8 (.86)
Quality of Life[c]	58.85 (24.81)	64.77 (23.25)	60.81 (20.48)	50 (10)

All values presented are based on untransformed data

** $p < .01$

[a] Absolute range 0–42

[b] Absolute range 1–7

[c] Absolute range 0–100

[d] Indicates which groups are significantly different

existing typologies and consider including attractions to other transgender persons.

Overall, findings from the psychological analyses suggested that FTMs of differing sexual orientations are more alike than different. For example, the only significant difference in these profiles was that AB FTMs reported slightly more anxiety than did AM FTMs, a finding consistent with the research literature. Gay and bisexual NT men, for example, have been found to report more symptoms of anxiety than their heterosexual counterparts (Cochran, Sullivan, & Mays, 2003; Fergusson, Harwood, & Beautrais, 1999). Moreover, in accordance with minority stress theory (Meyer, 1995), FTMs of differing sexual attractions in the current sample may share similar amounts of stress from being transgender in a largely sex-gender congruent society.

The nature and size of the community sample itself may help to explain the higher than anticipated AB and AM prevalence and the relatively healthy psychosocial outcomes. While the large sample size may more adequately represent this population, the non-clinical nature of this study may render direct comparisons with clinical samples difficult. Further, these results may be linked to the younger age and overwhelmingly white racial prevalence of the current sample. Significant racial health disparities have been found in transgender samples, including higher rates of HIV and lower rates of health insurance among trans people of color (Bith-Melander et al., 2010; Kenagy, 2005; Xavier, Bobbin, Singer, & Budd, 2005).

Shift in Sexual Attractions

In the present study, 40 % of participants who had transitioned reported a shift in their sexual attraction and these shifts were significantly associated with testosterone use. However, further examination of predictors of sexual attraction shifts revealed that once we accounted for pre-transition sexual attraction, testosterone use was no longer predictive of a shift. Specifically, those FTMs who were AW pre-transition were most likely to report a change in their sexual attraction, regardless of testosterone use. The most common change in sexual attractions in FTMs appears to be an increase in attractions to men. Given that the current study was correlational, it is not clear what caused the shifts in sexual attraction or whether the attractions reported had been present prior to transition were always present, but not expressed.

FTMs are more open to exploring a range of sexual attractions when their gender identity is in alignment with their bodies (Schleifer, 2006). In addition, pre-transition FTMs may not have pursued attractions to birth-assigned males because they did not want to be objectified as female-bodied persons (Devor, 1993a). Thus, it is possible that being perceived as male by sexual partners minimizes concerns over unequal or sexist treatment within the context of a sexual relationship, that, coupled with an increased sex drive due to testosterone, may allow FTMs to more easily explore attractions to men (Devor, 1993a; Dozier, 2005; Schleifer, 2006). Male-presenting AM FTMs who have had chest surgery and/or use testosterone, but who have not undergone genital modification, do not report elevated identity confusion or any intimacy disruption with their NT male sexual partners (Coleman & Bockting, 1988; 1991). Moreover, FTMs who have not had genital modifications have incorporated their vaginas into erotic activities with other gay men.

Psychosocial Well-Being

One of the primary aims of this study was to determine if there were differences in psychological well-being among FTMs with varying sexual orientations. In contrast with earlier literature using clinical samples, the between group median psychological well-being scores of this sample were all in the normative range (Lovibond & Lovibond, 1995a; Ware, Kosinski, & Dewey, 2000; Zimet et al., 1988). A majority of the sample did not fall in the clinical range for depression or anxiety, and the sample overall had higher quality of life scores than the U.S. national average (Ware et al., 2000). These data do not support the claim that FTMs are overall

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Table 6 Multivariate analysis of variance for sexual orientation

Source	$F(2, 501)$	Partial η^2	Power
Overall	3.02**		
Univariate tests			
Depression	2.99	.01	.58
Anxiety	4.65**	.02	.78
Stress	2.40	.01	.48
Social Support	2.06	.01	.42
Quality of Life	1.79	.01	.38

Analyses were conducted on log transformed data

** $p < .01$

more likely than the general population to suffer from mental disorders (Bodlund, Kullgren, Sundbom, & Hojerback, 1993; De Cuypere, Janes, & Rubens, 1995; Hepp, Kramer, Schnyder, Miller, & Delsignore, 2005). Finally, these data were consistent with more recent peer-reviewed reports that found fewer psychiatric problems in transgender samples than those from just a decade ago (Cole, O'Boyle, Emory, & Meyer, 1997; Hoshiai et al., 2010; Lawrence & Zucker, 2012). While this study did not assess psychological distress prior to transition, a significant correlation suggested that the longer FTMs are on testosterone, the fewer negative psychological symptoms and more social support they report receiving.

The large number of participants enabled us to detect small differences between groups. In general, there were few differences noted across the psychosocial well-being variables examined. Indeed, the only statistically significant difference observed was that AB FTMs reported more anxiety symptoms than AM FTMs. Because our data revealed small effect sizes, however, and because the overall mean and median scores of the groups were in the mild to normal ranges, even this difference, may not be *clinically* significant.

A possible explanation for the difference in anxiety is that AB FTMs are a double minority (Coleman et al., 1993) and, as such, they may experience challenges unique to both trans and bisexual individuals; these include invisibility, lack of validation, and marginalization, including from LGB and trans populations (Fox, 2003). These exclusions can interrupt the social reintegration that follows a gender transition, leaving one feeling unseen and/or unwitnessed by support groups and healthcare professionals (DiPlacidio, 1998; Herek et al., 2009; Meyer, 2003).

Limitations

Potential limitations of this study stem from the use of the internet for participant recruitment and participation. First, it is impossible to verify that all participants actually identify as FTM or were assigned female at birth. Second, it is possible that participants displayed a positive response bias, given that past research has pathologized transgender identities (Lev, 2004). Third, though our sample was large, non-clinically based, and diverse in many aspects, it was largely white. Fourth, the participants' high educational level and willingness to participate in sexuality research may index a more liberal or "adventurous" set of attitudes than would a more representative sample of FTMs. As FTMs tend to use online groups to seek information and navigate their transition, the participants in this study may represent a particular subset of FTMs. Fifth, the study lacked a concurrent NT heterosexual control group. Without any type of comparison groups (those with a "clinical problem" or a non-clinical group) matched to our sample, it is difficult to interpret the lower scores found in this study.

Other significant limitations of this study include the classification scheme used for measuring sexual orientation and the lack of diagnostic tools. Although the sexual orientation measure used in the current study was informed by the DSM-IV-TR's classification scheme, scales that provide more options and that measure differences over time may better capture the diversity of FTMs' sexual attractions. In addition, formal diagnoses of depression and anxiety could not be made in this sample. Therefore, while the differences found in this study indicated that AB FTMs report more symptoms of anxiety than AM FTMs, the findings did not indicate that AB FTMs were more likely to be clinically depressed or anxious.

Clinical Implications

As this study demonstrates, there was a greater range of attractions among FTMs than "straight" or "gay." In addition, a large portion (40 %) of FTMs surveyed reported a shift in sexual attraction. Following this study, it remains questionable how useful it is to have only four (if any) sexual orientation specifiers in the DSM. The DSM-5 proposed revisions to the GID diagnosis actually include the removal of the sexual orientation specifiers (APA, 2012).

Second, the literature is mixed on how to reference sexual orientation labels among transgender populations (APA, 2009). In the present study, FTMs who self-labeled as "homosexual" generally reported exclusive attractions towards men. Indeed, participants primarily used sexual orientation labels consistent with their gender identity rather than their birth sex as the referent. Thus, assigned sex-based sexual orientation labels do not seem related to FTMs' lived experience and may not be clinically or therapeutically appropriate.

Third, because this study's design and sample were not clinical in nature, the data were limited regarding how many participants met the formal criteria for GID. Several prospective reports, however, demonstrate that clinical distress–a hallmark of GID–dissipates following a medically necessary gender transition (Cohen-Kettenis & Gooren, 1999; de Vries, Steensma Doreleijers, & Cohen-Kettenis, 2010; Smith et al., 2005). The most recent WPATH recommendations state that a GID diagnosis is not a required medical indication for initiating a

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transition, including beginning to live in one's asserted gender role. The relevance of a GID diagnosis in a discussion of sexual orientation shifts or psychosocial well-being is unclear.

As of the writing of this manuscript, the sexual orientation specifier for the DSM-5 Gender Dysphoria diagnosis will most likely be removed. The results of the current study support the removal of this specifier. However, it has been suggested that there may be different developmental trajectories and causal mechanisms for gender dysphoria as a function of sexual attraction in MTFs (Blanchard, 1989; Luders et al., 2011). At present, the role that sexual attraction plays in the development of gender dysphoria in FTMs remains unclear.

Future Directions and Conclusion

Reports of shifts in sexual orientation among trans people are not a new phenomenon (Daskalos, 1998). In this study, the majority of FTMs who experienced shifts in sexual attractions reported that these attractions shifted away from women and towards either men or men and women both, as in Swaab (2004), and these shifts were significantly related to testosterone use. While exogenous testosterone may have played a role, further analysis regarding its mechanisms is warranted. Additional questions of interest include whether and to what extent AM FTMs represent a historically underrepresented group or an expansion of the range of attractions available to this population, due to changing hormones, virilization, and/or increased sex drive.

Prior research remains inconclusive regarding whether shifts in partner preferences are biological, social, or some combination thereof. Perhaps the process of masculinization, both social and physical, allows FTMs to enjoy the full range of their already-present attractions, because their bodies no longer restrict their intimate relationships (Devor, 1993b). The observed shift in sexual attractions may support Diamond's (2008) contention that birth-assigned females have more "fluid" sexual orientations.

In sum, it is recommended that researchers and clinicians do not use sexual orientation as a method of diagnostic specification in community samples of FTMs. Moreover, it is both clinically and theoretically important to acknowledge a more fluid range of sexual attractions amongst FTMs. Current data support that there are more psychological similarities than differences between FTMs of all sexual attractions, and that this larger, non-clinical sample reveals a population with good mental health.

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